I claim:

1. An electrolysis system for producing electrolyzed liquids, comprising:

an electrolysis cell having at least two chambers, an anode chamber and a cathode chamber, each chamber producing its own electrolyzed liquid;

means for separating gases produced along with the electrolyzed liquids during electrolysis;

means for controlling the proportions of the feed solutions introduced into the electrolysis cell;

means for collecting the separated gases; and,

means for collecting the gas reduced or gas free electrolyzed liquid.

2. The electrolysis system of claim 1 wherein the means for separating gases is a gas-liquid separator comprising at least two containers, a first container for separating gas from a gas liquid mixture and a second container for receiving gas reduced or gas free liquid, the first container for separating gas from a gas liquid mixture having an inlet port for the electrolyzed gas liquid mixture from the electrolysis cell chamber, an outlet port for the gas reduced or gas free liquid below the level of the gas in the container, a separate outlet port for the separated gas, and a volume above the outlet port for the gas reduced or gas free liquid enough to hold the volume of the separated gas, the second container for receiving gas reduced or gas free liquid having a height taller than the height of the first container to

hold enough volume that can exert pressure on the liquid inside the first container to allow or force the separated gas to escape from the gas outlet port of the first container while allowing the gas reduced or gas free liquid to exit at a separate outlet port of the second container.

3. The electrolysis system of claim 2 wherein the containers of the gas-liquid separator can have different geometric shapes.

4. The electrolysis system of claim 2 wherein the second container is an outer container and the first container is an inner container, the outer container having an inside surface larger than the outside surface of the inner container.

5. The electrolysis system of claim 2 wherein the first container is as wide as possible and as short as possible in relation to the second container and having the outlet port for the separated gas farthest from the inlet port for the electrolyzed gas liquid mixture.

6. The electrolysis system of claim 2 wherein the second container is a taller container and the first container is a shorter container having a channel allowing the flow of electrolyzed liquid from one container to the other.

7. The electrolysis system of claim 2 further comprising a means for preventing the recombination of the separated gas with the liquid and for maintaining the separation of the gas from the liquid.

8. The electrolysis system of claim 7 wherein the gas-liquid separator is prefilled with gas reduced or gas free electrolyzed

liquid prior to separating gases from a gas liquid mixture from the electrolysis cell chamber.

9. The electrolysis system of claim 7 wherein a level switch having a detecting component is placed inside the first container, the level switch connected to a vacuum pump that turns on to withdraw the separate gas when the level of the electrolyzed liquid is below the detecting component and turns off when the electrolyzed liquid reaches a point above the detecting component of the level switch.

10. The electrolysis system of claim 7 wherein the pressure and/or flow of the gas reduced or gas free electrolyzed liquid out of the gas-liquid separator is the same or not greater than the flow and/or pressure of the electrolyzed gas liquid mixture from the electrolysis cell chamber into the first container.

11. The electrolysis system of claim 1 wherein the gas is separated from the electrolyzed gas liquid mixture by a vacuum pump connected to a gas outlet port of a container having an inlet port for the electrolyzed gas liquid mixture from the electrolysis cell chamber, an outlet port for the gas reduced or gas free electrolyzed liquid and an open port for allowing air to enter the container.

12. The electrolysis system of claim 11 wherein the separated gas from the container is withdrawn by the vacuum pump to a second container before the separated gas is drawn through the vacuum pump to prevent the separated gas from recombining with the gas reduced or gas free electrolyzed liquid.

13. The electrolysis system of claim 1 wherein the means for separating the gas can be of the same type or of different types.

14. The electrolysis system of claim 1 further comprising a means for reprocessing and recovering the separated gases.

15. The electrolysis system of claim 14 wherein the reprocessed and recovered gas is chlorine, the chlorine gas reacting with alkaline water from the cathode chamber to form sodium hypochlorite or a bleaching solution.

16. The electrolysis system of claim 14 wherein the chlorine gas is reprocessed and recovered by combining with the feed solution to produce a more concentrated hypochlorous acid or reduce the requirement of brine.

17. The electrolysis system of claim 1 wherein the collection of gases produced during electrolysis is aided by a vacuum pump.

18. The electrolysis system of claim 17 further comprising means for preventing withdrawal of liquid into the vacuum pump.

19. The electrolysis system of claim 18 wherein liquid is prevented from entering the vacuum pump by a moisture trap installed before the vacuum pump.

20. The electrolysis system of claim 18 wherein a level switch having a detecting component connected to the vacuum pump turns on the vacuum pump only when the liquid level is below the detecting component.

21. The electrolysis system of claim 1 further comprising a means for neutralizing electrolyzed liquids produced from the anode chamber with the electrolyzed liquids from the cathode

chambers without addition of external reagents prior to discharge.

22. The electrolysis system of claim 1 further comprising a gas monitor or a gas leak detector to detect system failure in eliminating the gases.

23. The electrolysis system of claim 1 wherein the chambers of the electrolysis cell are each connected to a gas-liquid separator or a number of gas-liquid separators, the gas-liquid separators may be of the same type or different type.

24. The electrolysis system of claim 1 wherein the electrolyzed liquids produced are primarily hypochlorous acid solution at the anode chamber and primarily sodium hydroxide solution at the cathode chamber.

25. The electrolysis system of claim 1 wherein the system or parts thereof is automated.

26. A gas-liquid separator for separating gases from gas-liquid mixtures, comprising:

at least two containers, a first container for separating gas from a gas liquid mixture and a second container for receiving gas reduced or gas free liquid, the first container for separating gas from the gas liquid mixture having an outlet port for the gas reduced or gas free liquid below the level of the gas in the container, a separate outlet port for the separated gas, and a volume above the outlet port for the gas reduced or gas free liquid enough to hold the volume of the separated gas, the second container for receiving gas reduced or gas free liquid

having a height taller than the height of the first container to hold enough volume that can exert pressure on the liquid inside the first container to allow or force the separated gas to escape from the gas outlet port of the first container while allowing the gas reduced or gas free liquid to exit at a separate outlet port of the second container.

27. An environmentally safe electrolysis system, comprising:

an electrolysis cell having an anode and a cathode chamber, each chamber producing its own electrolyzed liquid;

means for controlling the proportions of the feed solutions introduced into the electrolysis cell;

means for reducing the level of toxic gases liberated into the environment during electrolysis;

means for collecting the electrolyzed liquid products; and

means for neutralizing the electrolyzed liquid products from the anode with the electrolyzed liquid products from the cathode without addition of external reagents prior to discharge.

28. A method for separately collecting gas from an electrolyzed gas liquid mixture using a gas-liquid separator, comprising:

introducing an electrolyzed gas liquid mixture from an electrolysis chamber into an inlet port of a gas-liquid separator at a rate greater or equal than the flow of the gas reduced or gas free electrolyzed liquid from the gas-liquid separator, the electrolyzed gas-liquid mixture flowing from a first container to a second container from an outlet port of the first container to an inlet port of the second container as gas separates from the

electrolyzed gas liquid mixture and collects and discharges at a gas outlet port of the first container;

continuously flowing the gas reduced or gas free electrolyzed liquid from the first container into the second container until the electrolysis is completed, keeping the level of the electrolyzed liquid in the second container above the level of the electrolyzed liquid in the first container to a volume sufficient to provide enough pressure to keep the separated gas collecting and discharging at the gas outlet port of the first container;

continuously collecting the gas reduced or gas free electrolyzed liquid from an outlet port of the second container; and,

continuously collecting the separated gas from the gas outlet port of the first container.

29. The method of claim 28 further comprising cleaning the gas-liquid separator by periodically switching the positions of the gas-liquid separators connected to the electrolysis cell.

30. The method of claim 28 further comprising adsorbing or absorbing the collected gas.

31. The method of claim 28 further comprising reprocessing and recovering the collected gas.

32. A method for reprocessing and recovering chlorine gas produced during electrolysis, comprising:

introducing electrolyzed gas liquid mixture containing chlorine gas from an anode chamber of an electrolysis cell into

an inlet port of a first container of a gas-liquid separator at a rate greater or equal than the flow of the gas reduced or gas free electrolyzed liquid from the gas-liquid separator, the electrolyzed gas liquid mixture from the anode chamber flowing from the first container to a second container from an outlet port of the first container to the second container as the gas separates from the electrolyzed gas liquid mixture introduced into the first container and collects and discharges from a gas outlet port of the first container;

continuously flowing the gas reduced or gas free electrolyzed liquid from the first container into the second container until the electrolysis is completed, keeping the level of the gas reduced or gas free electrolyzed liquid in the second container above the level of the introduced electrolyzed gas liquid mixture in the first container to a volume sufficient to provide enough pressure to keep the separated chlorine gas collecting and discharging from the gas outlet port of the first container;

collecting the gas reduced or gas free electrolyzed liquid from an outlet port of the second container for use or storage;

collecting the separated chlorine gas from the gas outlet port of the first container; and,

reacting the collected chlorine gas with alkaline water from a cathode chamber of the electrolysis cell to produce sodium hypochlorite or a bleaching solution or reacting the collected chlorine gas with water to produce hypochlorous acid.